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## THE GEOLOGY OF KILLINEY.

Few cities can boast of such a variety of beautiful scenery in its immediate vicinity as occurs within a short distance from Dublin. We need not allude to the objects of deep historical interest with which the natural beauties of Dublin are associated, as they have often been illustrated in these pages. The picturesque beauties of Dublin Bay and the county of Wicklow are known to all; but it is less generally known that the same localities abound in matters well calculated to excite the curiosity of the naturalist. From the great variety of rocks, and consequently of soil, around Dublin, we find a corresponding variety in its vegetable productions; and we believe we are pretty correct when we state that the botanist may collect specimens of nearly two-thirds of the indigenous plants of Ireland within the distance of a few miles from the capital. As regards Zoology, or the study of animals, our position is equally fortunate. The shores near Malahide are uncommonly rich in marine productions, especially shells; and the Bay of Dublin is not inferior to the coasts of Devonshire for the variety of its zoophytes and corallines. In the work of Ellis on British Corallines, we find that, although that admirable naturalist resided in London, he obtained many of his finest specimens from Dublin. In respect to mineralogical and geological pursuits, we are equally well situated. At Killiney and in the mines of Wicklow several interesting and some very rare minerals may be collected. In geology, in the strict sense of the word, there are many curious phenomena which should be repeatedly examined by the student, and he will find such a mode of proceeding infinitely more profitable than the more indolent method of confining his researches to such instruction as can be found in books and sections. At Howth, or the promontory of Bray, he may examine every diversity of stratification, and may observe all the upheavings and contortions to which rocks have been exposed, displayed as in a model, open to the contemplation of the man of science, and to the instruction of all. The granite veins of Killiney are also extremely curious, and well deserve to be repeatedly visited by the beginner in geological pursuits. It is true that the questions to which such phenomena gave rise have been long since set at rest; but it is also true that the questions must be mastered by every student, and we know of no place where this can be done to more advantage than at Killiney.

Every one is aware that rocks are formed in two very different ways. They may be produced either from the decayed materials of older rocks, carried down to the sea or lakes by the rivers, and subsequently consolidated by various processes, which geologists have explained, or they may be formed by the solidifying of liquid matter poured forth through some volcanic aperture from the deeper parts of the earth. The first kind of rocks are disposed in layers, beds, or strata, by the return of water, and hence are called stratified, and also aqueous or water-formed; the second, being liquid matters which have become hard from cooling, are called igneous, or fire-produced rocks. As volcanoes are at present confined to particular regions of the earth, some may imagine that such igneous rocks should only be found in volcanic regions. This, however, is a mistaken supposition, for geology assures us that igneous rocks are to be found in every mountain range. The mode of reasoning which they follow is equally simple and convincing. If we visit Howth, for example, we find many of the strata resting on their edges, or variously twisted. At the Killerys in the west of Ireland we find strata composed of rolled pebbles, elevated to a very considerable angle. It is impossible that strata of loose sand or gravel would have been originally deposited in such inclined positions, and we know of no natural power which would elevate them but that of the igneous agency, producing either a violent earthquake, or a long-continued upward pressure. This opinion is much strengthened, when we find in every country, whether volcanic or not, a series of rocks which appear to have been violently inserted among the strata, and which we can prove were once in a state of intense heat and fusion, like the lavas from a modern volcano.

The granite of Killiney is one of those igneous rocks, and the appearances which we detect in that interesting locality afford satisfactory evidence of its mode of formation. When we descend to the shore by the stairs, a little to the east of the Obelisk, we find ourselves in a little way bounded by perpendicular rocks. These rocks are of two kinds—granite, and a schistose or slaty rock, of a bluish colour, which we

may term mica-schist. We then observe that the mica-schist rests on its edges, on a pavement of granite, and also reclines against that rock. The junction of the two rocks may be seen with the utmost perspicuity; and there is no blending of their characters, even where they are in absolute contact. We may next observe a ledge of rock partly covered by the waves, and extending in nearly a north and south course along the shore. This is a granite vein of many feet in breadth, and several hundred yards in length, and may easily be traced for a considerable distance. This granite vein is bounded on both sides by mica-schist; and, what is still more important, we may follow the vein till it is lost in the general mass of granite of the hill. When we now remember that the water-formed rock (the mica-schist) is standing on edge, a suspicion arises that the granite is a fire-produced rock, and has been the agent of this elevation, and the large wall of granite may have been intruded in a molten state between the beds of mica-schist. If it be objected that the granite vein is merely a portion of the strata of mica-schist, and was like them deposited from water, an inspection will dissipate this illusion; for we observe that the great vein running parallel to the strata gives off a smaller vein at right angles to the direction of the strata. On examining this smaller vein, which may be seen a little to the north of the stairs, all doubts respecting its nature or origin are very soon removed. We are surprised to find that this vein contains fragments of the mica-schist. We may therefore conclude from this that originally fissures were produced in the schist, and these fissures were filled up by molten granite, which entangled fragments of the mica-schist which fell from the sides of the fissure. It is scarcely necessary to add, that we know of no agent capable of melting granite but heat.

When we examine this interesting spot a little more minutely, we detect many other granite veins, each affording some curious and minute fact in harmony with the preceding remarks. Every one knows that it is easier to split a piece of wood in the direction of the grain, than transversely to that direction. In the same way we may infer that it is easier for a liquid granite to insinuate itself between the strata than to force its way across them, and on examination we find this to have been the case. In the first place, the large vein first mentioned running in the course of the strata is broader than all the transverse veins put together. Secondly, when we examine the cross veins, we find they have had more difficulty in forcing their way; hence they frequently contain fragments. Perhaps, however, an examination at another point near the entrance of the abandoned lead-mine affords the most curious evidence of these remarks, for there we perceive that the vein does not hold a straight course, nor is it of equal thickness throughout, but, on the contrary, is of unequal breadth, and serpentine, as if the strata had been violently lacerated instead of being split. In this case the vein has cut across the strata, and includes fragments of the mica-schist. But the most curious circumstance in this example is, that the vein itself has been broken, and its fractured extremities a little displaced and detached, thus proving that the strata had been exposed to concussion and displacement at a period posterior to that when the vein was formed.

If this very brief description will induce any of our readers to visit the granite veins of Killiney, we are sure he will find that his excursion will not be an unimproving one, and he will perhaps be convinced that he has only to look about him to find sources of enjoyment which so many are ignorant of, but which are within the command of all. S.

**DOMESTIC DISCIPLINE OF THE DUTCH.**—There are two things of a peculiar character in Holland, which deserve to be noticed. One is the enactment authorising husbands, wives, and children to be imprisoned in a house of correction set apart for the chastisement of offences against the laws by which the relations of social life are governed—the other, a contrivance for compelling the incorrigibly idle to work. In one of the rooms is a pump, and a stream of water runs in from the ceiling; so that unless the prisoner labours continually, he must be inevitably drowned.

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